

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (currently amended): An anisotropic material comprising an alternating-line pattern and a layer of at least one functional compound selected from the group consisting of a semiconductor compound, an electrically conductive compound, a photochromic compound and a thermochromic compound, formed on a surface of the alternating-line pattern, wherein one type of lines in the alternating-line pattern surface comprises a fluorine-containing compound, the fluorine-containing compound is at least one fluorine-containing organic silane compound selected from the group consisting of:

(a) a fluorine compound of the formula:

$\text{Rf-A-SiX}_3$ , or

$\text{Rf-O-A-SiX}_3$ ,

wherein Rf is a branched perfluoroalkyl group having 3 to 5 carbon atoms,

A is an alkylene group having 1 to 4 carbon atoms,

$\text{Aa-SO}_2\text{N(R}^{21}\text{)R}^{22}$ - group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms,

and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH(OH)CH}_2-$  group, and

X is a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4,

(b) a fluorine compound having a perfluoropolyether group of the formula:

$\text{PFPE-A-SiX}_3$ ,

wherein PFPE is a perfluoropolyether group,

A is an alkylene group having 1 to 4 carbon atoms,

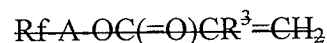
a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group, and

X is a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4,

(c) a fluorine compound having a polymer structure of the formula:

Polymer-D-SiX<sub>3</sub>,

wherein Polymer represents a polymer structure group obtained by polymerizing a monomer which has a fluoroalkyl group having 5 or less carbon atoms, and perfluoroalkyl group-containing monomer represented by the general formula:



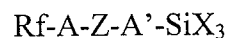
~~wherein Rf is a straight chain or branched perfluoroalkyl group having 1 to 5 carbon atoms,~~

~~$\text{R}^3$  is a hydrogen atom, an F atom, a Cl atom, a  $\text{CF}_3$  group, a  $\text{CF}_2\text{H}$  group, a  $\text{CFH}_2$  group or a methyl group, and~~

~~A is an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group, D represents  $-\text{S}(\text{CH}_2)_2\text{OCONH}(\text{CH}_2)_q-$   $-\text{S}(\text{CH}_2)_p\text{OCONH}(\text{CH}_2)_q-$  wherein p and q are 1 to 4, or  $-\text{CH}_2\text{CH}_2-$ , and~~

X represents a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4, and

(d) a fluorine compound ~~having a linking group~~ of the formula:



wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms,

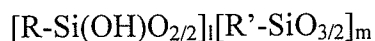
A and A' represent an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group,

Z is a urethane group, an ester group, an ether group or an amide group, and

X is a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4, or

the fluorine-containing compound is at least one selected from the group consisting of:

(e) an incompletely-condensed silsesquioxane which has a perfluoroalkyl group having 5 or less carbon atoms, represented by the general formula:



wherein R and R' represent Rf, Rf-A, an alkyl group having 1 to 22 carbon atoms, or a derivative of an alkyl group having 1 to 22 carbon atoms provided that at least one of R and R' is Rf or Rf-A wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms, and A represents an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group, and l and m represent such a number that a molecular weight of the incompletely-condensed silsesquioxane is within a range from 500 to 100000, and

(f) a completely-condensed silsesquioxane which has a silane group and a perfluoroalkyl group having 5 or less carbon atoms, represented by the formula:



wherein R represents Rf, Rf-A, an alkyl group having 1 to 22 carbon atoms, or a derivative of an alkyl group having 1 to 22 carbon atoms provided that at least one of R is Rf or Rf-A wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms, A represents

an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group,  $\text{R}'$  represents an organic group containing  $\text{SiX}_3$ , wherein X is a hydrogen atom, a halogen atom or  $\text{OC}_n\text{H}_{2n+1}$  where  $n=1$  to 4 and l and m represent such a number that a molecular weight of the completely-condensed silsesquioxane is within a range from 500 to 100000.

2. (previously presented): The anisotropic material according to claim 1, wherein a difference between surface free energy of the type of lines comprising the fluorine compound and surface free energy of the other type of lines is at least  $5 \text{ mJ/m}^2$ .

3. (original): The anisotropic material according to claim 1, wherein the alternating-line pattern has a line width of 0.5 to  $100 \mu\text{m}$ .

4. (original): The anisotropic material according to claim 1, wherein the alternating-line pattern has unevenness of not more than 10 nm.

5. (original): The anisotropic material according to claim 1, wherein the shape of droplets is distorted when  $2 \mu\text{L}$  of ethanol is gently dropped from above the alternating-line pattern, and the degree of distortion is at least 1.1 in terms of a ratio  $L/W$  of the length in a major axis (L) to the length in a minor axis (W) of droplets.

6. (canceled).

7. (withdrawn-currently amended): A method for producing an anisotropic material comprising an alternating-line pattern and a layer of at least one functional compound selected from the group consisting of a semiconductor compound, an electrically conductive compound, a photochromic compound and a thermochromic compound, formed on a surface of the alternating-line pattern, wherein one type of lines in the alternating-line pattern surface

comprises a fluorine-containing compound, the fluorine-containing compound is at least one fluorine-containing organic silane compound, selected from the group consisting of:

(a) a fluorine compound of the formula:

$\text{Rf-A-SiX}_3$ , or

$\text{Rf-O-A-SiX}_3$ ,

wherein Rf is a branched perfluoroalkyl group having 3 to 5 carbon atoms,

A is an alkylene group having 1 to 4 carbon atoms,

$\text{Aa-SO}_2\text{N(R}^{21}\text{)R}^{22}$ - group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms,

and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH(OH)CH}_2-$  group, and

X is a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4,

(b) a fluorine compound having a perfluoropolyether group of the formula:

$\text{PFPE-A-SiX}_3$ ,

wherein PFPE is a perfluoropolyether group,

A is an alkylene group having 1 to 4 carbon atoms,

$\text{a-SO}_2\text{N(R}^{21}\text{)R}^{22}$ - group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms,

and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH(OH)CH}_2-$  group, and

X is a hydrogen atom, a halogen atom, or  $\text{OC}_n\text{H}_{2n+1}$  wherein n is 1 to 4,

(c) a fluorine compound having a polymer structure of the formula:

$\text{Polymer-D-SiX}_3$ ,

wherein Polymer represents a polymer structure group obtained by polymerizing a monomer which has a fluoroalkyl group having 5 or less carbon atoms, and

~~perfluoroalkyl group containing monomer represented by the general formula:~~

~~$\text{Rf-A-OC(=O)CR}^3=\text{CH}_2$~~

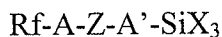
~~wherein Rf is a straight chain or branched perfluoroalkyl group having 1 to 5 carbon atoms,~~

~~R<sup>3</sup> is a hydrogen atom, an F atom, a Cl atom, a CF<sub>3</sub> group, a CF<sub>2</sub>H group, a CFH<sub>2</sub> group or a methyl group, and~~

~~A is an alkylene group having 1 to 4 carbon atoms, a -SO<sub>2</sub>N(R<sup>21</sup>)R<sup>22</sup>-group provided that R<sup>21</sup> is an alkyl group having 1 to 4 carbon atoms, and R<sup>22</sup> is an alkylene group having 1 to 4 carbon atoms or a -CH<sub>2</sub>CH(OH)CH<sub>2</sub>- group, D represents -S(CH<sub>2</sub>)<sub>2</sub>OCONH(CH<sub>2</sub>)<sub>q</sub>-  
-S(CH<sub>2</sub>)<sub>p</sub>OCONH(CH<sub>2</sub>)<sub>q</sub>- wherein p and q are 1 to 4, or -CH<sub>2</sub>CH<sub>2</sub>-, and~~

X represents a hydrogen atom, a halogen atom, or OC<sub>n</sub>H<sub>2n+1</sub> wherein n is 1 to 4, and

(d) a fluorine compound ~~having a linking group~~ of the formula:



wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms,

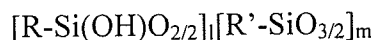
A and A' represent an alkylene group having 1 to 4 carbon atoms, a -SO<sub>2</sub>N(R<sup>21</sup>)R<sup>22</sup>-group provided that R<sup>21</sup> is an alkyl group having 1 to 4 carbon atoms, and R<sup>22</sup> is an alkylene group having 1 to 4 carbon atoms or a -CH<sub>2</sub>CH(OH)CH<sub>2</sub>- group,

Z is a urethane group, an ester group, an ether group or an amide group, and

X is a hydrogen atom, a halogen atom, or OC<sub>n</sub>H<sub>2n+1</sub> wherein n is 1 to 4, or

the fluorine-containing compound is at least one selected from the group consisting of:

(e) an incompletely-condensed silsesquioxane which has a perfluoroalkyl group having 5 or less carbon atoms, represented by the general formula:



wherein R and R' represent Rf, Rf-A, an alkyl group having 1 to 22 carbon atoms, or a derivative of an alkyl group having 1 to 22 carbon atoms provided that at least one of R and R' is

Rf or Rf-A wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms, and A represents an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group, and l and m represent such a number that a molecular weight of the incompletely-condensed silsesquioxane is within a range from 500 to 100000, and

(f) a completely-condensed silsesquioxane which has a silane group and a perfluoroalkyl group having 5 or less carbon atoms, represented by the formula:



wherein R represents Rf, Rf-A, an alkyl group having 1 to 22 carbon atoms, or a derivative of an alkyl group having 1 to 22 carbon atoms provided that at least one of R is Rf or Rf-A wherein Rf represents a perfluoroalkyl group having 5 or less carbon atoms, A represents an alkylene group having 1 to 4 carbon atoms, a  $-\text{SO}_2\text{N}(\text{R}^{21})\text{R}^{22}-$  group provided that  $\text{R}^{21}$  is an alkyl group having 1 to 4 carbon atoms, and  $\text{R}^{22}$  is an alkylene group having 1 to 4 carbon atoms or a  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2-$  group, R' represents an organic group containing  $\text{SiX}_3$ , wherein X is a hydrogen atom, a halogen atom or  $\text{OC}_n\text{H}_{2n+1}$  where  $n=1$  to 4 and l and m represent such a number that a molecular weight of the completely-condensed silsesquioxane is within a range from 500 to 100000,

which method comprises applying a solution of at least one functional compound selected from the group consisting of a semiconductor compound, an electrically conductive compound, a photochromic compound and a thermochromic compound on the surface of an alternating-line pattern, one type of lines of which comprises a fluorine-containing compound.

8. (withdrawn): The method according to claim 7, wherein a liquid which dissolves the functional compound is a solvent having a surface tension of not more than 30 mN/m.

9. (withdrawn): A method for producing a functional material, comprising using, as a template, a pattern surface composed of plural regions each having different surface free energy, characterized in that:

(1) at least one region of the pattern surface is treated with a fluorine compound, and

(2) the method comprises applying a functional compound solution on the pattern surface and removing a solvent.

10. (canceled).

11. (withdrawn): A functional material produced by the method according to claim 9.

12. (withdrawn): A method for producing a functional material, which comprises applying a functional compound to a pattern surface having at least one region surface-treated with a fluorine compound.

13. (withdrawn): The method according to claim 12, wherein the fluorine compound comprises a fluorine compound having the following structure:

(a) a fluorine compound which has a branched fluoroalkyl group having 5 or less carbon atoms,

(b) a fluorine compound having a perfluoropolyether group,

(c) a fluorine compound having a polymer structure obtained by polymerizing a monomer which has a fluoroalkyl group having 5 or less carbon atoms,

(d) a fluorine compound having a linking group which is any one of an urethane group, an ester group, an ether group and an amide group, existing between a fluoroalkyl group having 5 or less carbon atoms and a functional group,



(e) an incompletely-condensed silsesquioxane which has a fluoroalkyl group having 5 or less carbon atoms, and

(f) a completely-condensed silsesquioxane which has a silane group and a fluoroalkyl group having 5 or less carbon atoms.

14. (withdrawn): A functional material produced by the method according to claim 12.

15. (previously presented): An anisotropic material according to claim 1, wherein both lines of the alternating-line pattern are made of a monomolecular film.

16. (previously presented): The anisotropic material according to claim 1, wherein the layer of the at least one functional compound has a thickness of from 0.1 nm to 100  $\mu\text{m}$ .

17. (previously presented): The anisotropic material according to claim 1, wherein the fluorine-containing compound comprises compound (a).

18. (canceled).